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DEPARTMENTS.

SOLUTIONS OF PROBLEMS.

ARITHMETIC.

150. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, Ohio.

A commission merchant sold $\$W,=\$4750$ worth of wheat. After deducting his commission at $m\%,=3\%$, purchased with the proceeds a draft at $d,=60$ days at $r\%,=10\%$, interest, and at $p\%,=\frac{3}{4}\%$ premium. What was the face of the draft ?

Solution by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa., and P. S. BERG, B. Sc., Principal of Schools, Larimore, N. D.

$$\$W(100\%-m\%)=\$4750\times.97=\$4607.50.$$

$$(d+3)\text{ days}=63\text{ days},\ \frac{(d+3)r\%}{36}=\frac{63\times10\%}{36}=.0175.$$

$$100\%+p\%-\frac{(d+3)r\%}{36}=1.0075-.0175=.99.$$

$$\$6407.50\times.99=\$6343.425.$$

151. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, O.

A merchant marked a lot of goods $m\%=20\%$, above cost; but, in consequence of a rise in the market price, he marked up the goods $n\%=10\%$, on the marked price. What per cent. was the last selling price of the goods ? What would be his gain on sales amounting to $\$S=\$5780.50$?

Solution by JAMES F. LAWRENCE, A. B., Instructor in Mathematics, Rogers Academy, Rogers, Ark.

1. Let $r\%=100\%=$cost.
2. $\therefore$ $r\%+m\%=$marked price.
3. Let $p\%=100\%=$marked price$=r\%+m\%$.
4. $1\%=\dfrac{r+m}{p}\%$.
5. $(p+n)\%=\dfrac{(r+m)(p+n)}{p}\%=132\%=$selling price.
6. $\therefore$ $32\%=$gain on cost price.
7. But $\dfrac{(r+m)(p+n)}{p}\%=\$S=\$5780\frac{1}{2}$.
8. $\therefore$ $r=100\%=\dfrac{rpS}{(r+m)(p+n)}=\$4379\frac{1}{6}=$cost.
9. $\therefore$ $\$1401\frac{1}{3}=\$5780\frac{1}{2}-\$4379\frac{1}{6}=$gain.

Also solved by *T. T. DAVIS*, Principal of High School, Portland Oregon; *G. B. M. ZERR*, *C. A. LINDEMAN*, and *P. S. BERG*.